UPSTREAM: A 2D Film Depicting the Factors on Survivability of Lobed River Mullet "*Ludong*" Species (*Cestraeus plicatilis*)

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Abstract

This study aimed to portray the Lobed River Mullet "*Ludong*" specie's survivability through the use of a 2D film: "Upstream" in order to provide awareness about its current state, for such is now considered an endangered species. The study produced a film portraying a biologist from the Bureau of Fisheries and Aquatic Resources discussing the *Ludong*'s background, uniqueness and reason it became endangered species at present. The said film aimed to promote awareness about the specie, introduce the possibility that the *Ludong* may soon become a national symbol of the Philippines, show the importance of its conservation and provide consciousness about its condition. Using Descriptive Research Method, the researchers conducted an interview with the BFAR - Region II, Ms. Evelyn Ame, head of the Ludong's Conservation and Research Department. There were four groups of respondents namely: (3) BFAR personnel, (10) fishermen, (16) residents of Cagayan Valley and (2) animation experts. Non-probability convenience type of sampling was used in gathering data for the fishermen and residents of Cagayan Valley and purposive type of sampling for BFAR personnel and animation experts. The results showed that the film produced was effective in spreading awareness about the said species and was also recognized by the animation experts as a full-fledged animated film. In the end, the BFAR recommends the film to be published on social media sites and to be displayed as local advertisement in government buildings.

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The creatures under the sea are considered to be wonders of the world which humans treasure. But with the unawareness and carelessness of people, some of the species become extinct. There are 228,000 known species in the ocean. Among all these, fishes are one of the most important for human needs, primarily as a source of food and second as a form of livelihood through fishing. There are over 30,000 known species of fishes in the world.

While habitat destruction and pollution are contributing factors that affect their extinction, the greatest threat so far is improper fishing. There are lists of rules and restrictions on fishing which fishers often neglect to give importance- starting from the catch limits, possession limits and size restrictions. Fishers catch two to three times more than what is needed. Over 25% of all world's fish stocks are either overexploited or depleted and another 52% is fully exploited based on UN Food and Agriculture Organization's figures. In this case, we are in risk of losing a valuable food source many depend upon.

Over 25% of the world's fisheries have been forced beyond their biological limits and are in need of strict management plans on conserving. Some of the fish population has become worse in condition to the point where their survival as a species is threatened. Based on scientists' studies, they agreed that at current usage, many important fish stocks will be removed from the system in the next 25 years.

According to Dr. Daniel Pauly, the big fish, the bill fish, the groupers will be gone. If things go unchecked, there will be a sea full of little horrible things that nobody wants to eat. It might end up with a marine junkyard dominated by plankton.

There are 102 reported endangered fish species in the Philippines alone. One of them is the lobed river mullet, which is commonly known in the Philippines as "*ludong*".

It is said to be one of the country's diverse collections of flora and fauna like the bleeding heart pigeon and the Philippine Eagle (Taguinod, 2010).

Moreover, it is called the "Presidential Fish" for it is said to be the most expensive fish in the country. The species is prevalent in the Cagayan Valley region located in Luzon and along the Pacific Ocean. It is very

territorial and swims through the strong current and rocky parts of the Cagayan River based on a study by Ms. Evelyn Ame. (Fisheries Resources Management Division, Bureau of Fisheries and Aquatic Resources, 2Regional Fisheries Office No. II, Tuguegarao City, Cagayan)

It is endemic in the Philippines. Its habitat is limited to a few rivers in the north. It sells for PHP5,000.00 (approximately US$114.00) a kilogram which only the wealthiest can afford, making it the most expensive fish in the Philippines, according to Ayson in her interview with Philippine Daily Inquirer in 2010.

Also, it dominates the market price because it is seasonal and it is hard to catch. It is catadromous in nature, which means it migrates to the ocean in order to breed. After the lobed river mullet had undergone downstream migration, it can be caught in Cagayan River. The Cagayan River passes through the famous Magapit Suspension bridge that stood as the silent witness to the countless *ludongs* swimming mightily upstream.

The number of *ludong* catch has been decreasing annually and based on the vendors' observation, the size of *Ludong* is getting smaller over the years. In addition, no *ludong* had been caught in 2002 and 2003 according to the

Bureau of Fisheries and Aquatic Resources. It was also reported that the fish's size has become smaller over the years. Also, most of the fishermen are stubborn; they kept fishing during the *ludong's* spawning season said Ms. Evelyn Ame from BFAR. The researchers were encouraged to administer the study due to the following reasons: (1)*Ludong* conservation programs receive minimal attention as evidenced by the death of all *Ludongs* in the *Ludong* Conservation Facility in Aparri, Cagayan, (2) less attention is given to the species and its condition and (3) no animated clip/film supports the conservation of the said species and recognizes it as endangered species at present.

Hence, the study aimed to produce a 2D animated film that intends to provide the audience awareness on the near extinction of the lobed river mullet. This shows why the said specie is now in danger of extinction and how the species could be saved. The study is aligned with Republic Act No. 8550, otherwise known as "The Philippine Fisheries Code of 1998".

Republic Act (RA) 8550 is the response to address the trend of blind resource exploitation. This Act, otherwise known as the Fisheries Code of 1998, is the governing law in Philippine fisheries to address the interconnected

issues of resource degradation and unrelenting poverty among municipal fishers. It provides for a national policy on sustainable use of fishery resources to meet the growing food needs of the population. It calls for management of fishery and aquatic resources in a manner that is consistent. There is the newly amended Republic Act no. 10654, an act to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Republic act no. 8550, otherwise known as: "The Philippine fisheries code of 1998," and for other purposes". The study also supports Fisheries Administrative Order (FAO) No. 31, aimed at conserving the ludong in Northern Luzon, specifically, FAO 31 prohibits the capture, purchase, sale, preparation, and serving of ludong for private or public consumption during its seasonal migration (October to January). It also prohibits the use of tabukol (a cast net of large meshes), tabak (small drag seine for river fishing) or pateng (cylindrical fish pot for catching mullet) in the Cagayan River and its tributaries and in the Santa-Abra River System during these months.

On the maintenance and operation of the *ludong* laboratory and experimental station, the agency had conducted 137 monitoring activities on water quality parameters in tanks and ponds, 10 regular sampling of

mullet stocks, and one hands-on training on breeding of *ludong*, among others.

Expectedly, because of its rarity, research efforts towards the conservation of *ludong* have been directed mainly on aqua- culture and artificial breeding to improve production and supply.

If the offense involves catching of spawning ludong during the closed season, a penalty of six months and one day to eight years imprisonment and/or fine of P80,000 shall be imposed, according to BFAR.

According to the Bureau of Fisheries and Aquatic Resources Administrative Circular (BAC) 247, series of 2013 “Amending FAO 31 s., 1952 on the conservation of the Ludong in Northern Luzon” the said order declares, a closed season which is from October 1 to November 15 of each year, wherein taking of ludong of any size or by any fishing gear or method is prohibited in Cagayan River, its tributaries, headwaters and watersheds in the Cagayan Valley, and the Abra River Basin System of Ilocos Sur and Abra. This aims to preserve ludong during its spawning period.

Conceptual Framework

The conceptual framework for this study was divided into three major phases namely: the pre-production phase, the production phase and the post-production phase.

In the pre-production phase, the researchers conducted a brainstorming on how the local and national government, the immediate communities and NGOs (if any) are currently dealing with the endangered population of the *ludong* species in Cagayan Valley. They accordingly have discovered that the country is facing a crisis over the *ludong* specie and the Filipinos are slightly aware if not totally unaware of the situation. The researchers came up with the concept of portraying the survivability of the species for the Filipino public. After establishing a concrete title, they researched about the species from various written references, resource persons and the internet. The researchers decided to make a 2D animated type of film and further decided which art style and software were to be used in creating the film. They came up with a storyline, suitable for the general public and target audience, which was highly informative and very interesting to watch.

The production phase involved the creation of each character and specific background designs for all the

scenes. Frame-by-frame animation was utilized in order to form the character's walk and swim cycle through the use of Adobe Photoshop. The researchers initiated to contact several key resource persons who are directly involved in the present salvation efforts being made in-country for the said endangered species. Direct personal interviews were made with the resource persons, so as to include follow-up questionnaires to the respondents.

Lastly, the post-production phase was where the researchers edited, rendered and combined all the rendered scenes, voice and sound effects of the film. A film preview were conducted, a review, and a post-evaluation of the film was performed prior to its final production for public viewing. Additional information on the documentation of the results of the survey, discussion, conclusion and recommendations were provided.

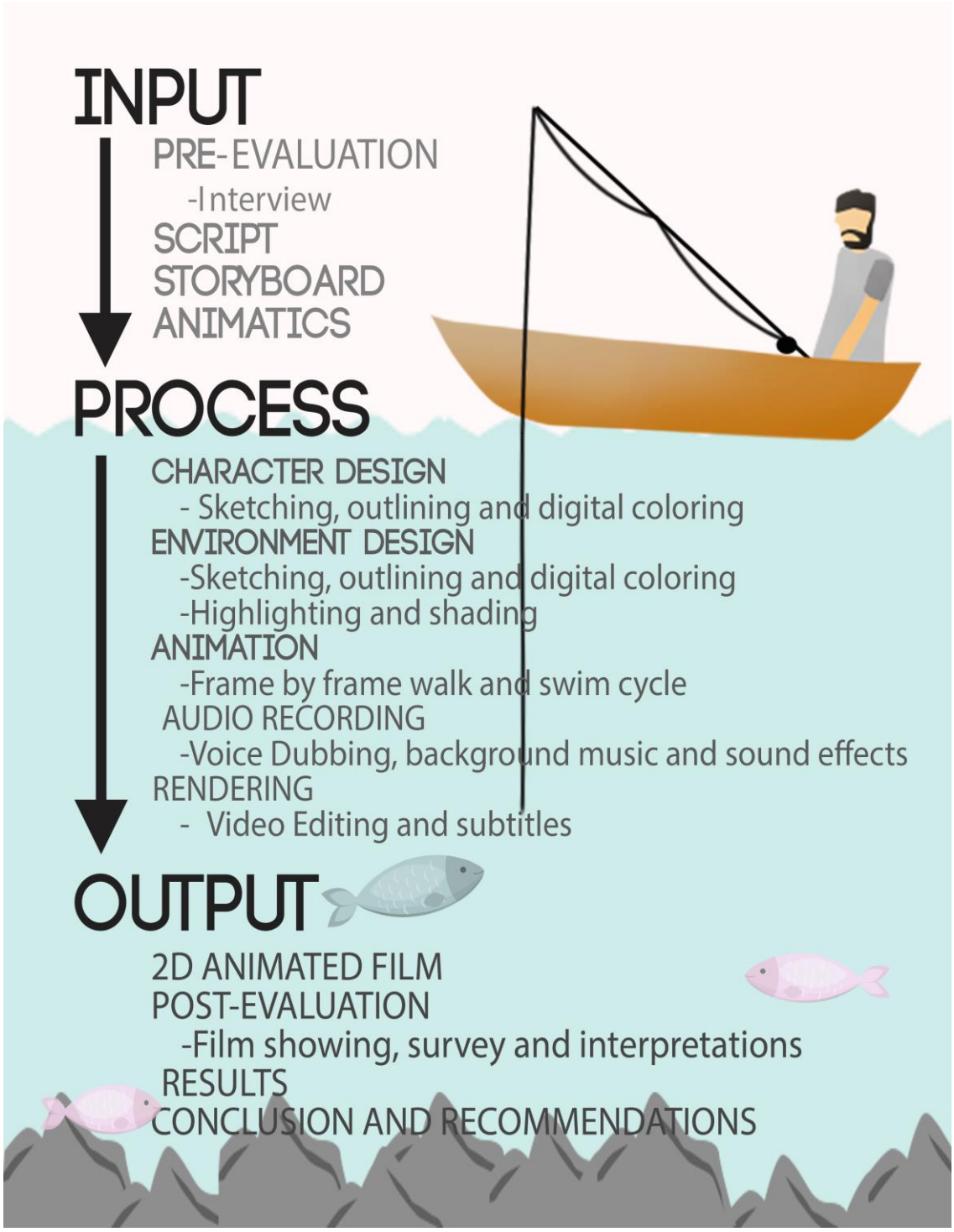

Figure 1: Conceptual Framework

Objectives of the Study

The researchers aimed to create and produce a 2D Animated Film that will:

- Introduce the possibility that the lobed river mullet "*ludong*" specie may soon become an icon and/or national symbol of the Philippines.
- Increase awareness locally in the immediate communities along the Cagayan River where the ludong thrives about the closed season specifically the Bureau of Fisheries and Aquatic Resources Administrative Circular (BAC) 247, series of 2013.
- Show the importance of its conservation and recognize the specie of ludong in the community with its unconventional survivability.
- Invoke the use of animated films in promoting or spreading awareness particularly the conservation of ludong.

Scope and Delimitation

The coverage of the study was about the lobed river mullet (Cestraeus plicatilis), locally known as "*ludong*" or "*banak*", and also called the "Presidential Fish" or the "Pacific Salmon". The study showed how a lobed river mullet lives and spawns in its lifetime, how it is being caught by local fishermen and how rightfully it should be done, and lastly the factors the *ludong* species has been compromised.

Other endangered species of fishes were not be covered in this study. Hence, the study may be limited to only *ludong* due to few researches published for the said local species and to the interview conducted to Dr. Evelyn C. Ame, Agricultural Center Chief II/ Training Division Chief, Fisheries Resources Management Division. Actual spawning was not tackled and shown in the film. Also, there were no list to confirm the legitimacy of the fishermen as respondents.

The 2D output of the study was developed using mainly Adobe software. Adobe Photoshop was used to render character designs, background designs and digital coloring. The Adobe Premiere Pro was used for the video editing and the final rendering.

Significance of the Study

The study will have an effect to the following:

Fishermen – fishermen are one of the primary beneficiaries of this research because they will be directly affected by lobed river mullet or ludong's extinction.

They are directly knowledgeable on its breeding and spawning behavior, as well as its spawning and breeding locations.

They could directly initiate the direly needed changes and implement better methods to greatly improve the chances of survival for the species. All these could be done with the commensurate support and efforts from other stakeholders with the resources to do it.

Economy - This study will be beneficial to the economy locally in particular and the whole country in general. An increased production of the species would definitely boost the local economy by providing more fish and better income for the fishermen. Moreover, as a species being sought for its unique flavor and taste among international connoisseurs, it gives a higher value for the species as an international commodity.

Citizens of the country- The people would also benefit in this study because they would be able to buy more of these fish species commercially, thereby lessening its high demand for its rarity. Also, this seafood will be fresh and will not have any preservative contents that can be harmful for the body. Also amusement parks like Manila Ocean Park will be able to add more rare species of fishes without endangering their numbers.

This study may be used as an instrument for the Bureau of Fisheries and Aquatic Resources (BFAR) to help increase awareness on conserving and preserving the *ludong* species and help future researchers on the survivability and conservation of the said species.

Through a partnership with BFAR, the researchers intended to produce a short film depicting the *ludong* for the local media in particular and online social media for the viewing of the public in general. This further helps the said bureau in advocating proper handling of the *ludong* species survival.

People of Cagayan Valley – the local communities along the Cagayan River would greatly benefit from this. A better understanding about the *ludong*- how it thrives and how it will survive as an endangered species- would likely to be resolved. Making these communities understand the

ludong as an endangered species would be very helpful and favorable in increasing the probability of its survival.

Researchers – the study will be beneficial for the researchers for them to have additional knowledge on the chosen topic and gain experience in doing research.

Future Researchers – this study will provide needed information for future researchers about the specie's background and also support their study.

College and University – the output may be used by the colleges and universities to support organizations with conservation advocacies.

Method

The main purpose of this study was to provide awareness of the lobed river mullet "*ludong*" species by understanding its survivability over the years of its existence and the factors that make it one of the country's endangered species as confirmed by the Bureau of Fisheries and Aquatic Resources as well as to evaluate the effectiveness of the information done through the use of a two- dimensional animated film.

This chapter discusses how the researchers gathered data that were used in the entire study. It describes the process, the respondents and the focus of the research. This also covers data collection and instruments used, research method and the research locale.

Research Design

Descriptive type of research was used in gathering information needed in the pre-evaluation phase of the study. Quantitative method of data collection was used in the study.

Interview through phone call from BFAR's Training Division Chief, Dr. Evelyn Ame was conducted. The interviewee answered some open ended questions about

ludong's survivability. The researchers also sent interview questions to the interviewee through e-mail to answer definitive type of questions. The final 2D output was shown to BFAR - Region II *Ludong* Research and Conservation Department authorized personnel, fishermen and residents along Cagayan Valley by the researchers before answering the post-evaluation survey questionnaire where a (5) five-point Likert scale was implemented. Two selected animators were also asked to evaluate the aesthetics and technical aspects of the film using a (4) four – point Likert scale. Comments and suggestions were also asked from the BFAR personnel to be able to obtain more information relating to *ludong*.

Participants

The respondents of the study included BFAR's authorized personnel, fishers, residents along Cagayan Valley and animators. The researchers conducted several phone calls and e-mail interviews with BFAR Region 2 Training Division Chief, Ms. Evelyn Ame for the pre-evaluation of the study.

The researchers considered BFAR Region II as one of their respondents in order to confirm the legitimacy of data that the output needs to exhibit. Through the

fishermen and Cagayan Valley residents' response on the post-evaluation, researchers determined the effectiveness of the film they had produced. Lastly, evaluation of practiced animators helped improve the aesthetics and technical aspects of the film and the delivery of the story that the researchers had executed.

The study's selection for the post-evaluation used a non-probability convenience type of sampling on fishermen and residents along Cagayan Valley while purposive type of sampling was used for BFAR personnel and animation experts.

Using a non-probability convenience type of sampling, the researchers conducted a post evaluation survey at Barangay Dugo, Camalaniugan, Cagayan and Lal-lo, Cagayan riverside as an accessible yet legitimate source of data for fishermen. It is where the famous Magapit Suspension Bridge is located. The Cagayan River passes through the Magapit Suspension Bridge and not farther downstream is Aparri Cagayan where freshwater and saltwater meet and where the *ludong* passes through during spawning season. Convenience sampling was also used to residents of Cagayan Valley on their post evaluation.

The researchers made use of purposive type of sampling for BFAR personnel in the BFAR Region-2 Government Center,

Carig, Tuguegarao City, specifically, those under the Ludong's Conservation and Research Department.

Purposive type of sampling was also used for the (2) two practiced animators who evaluated the film; (1) Mary Jane Quiambao who works at PlayHaus Game Development and Technology Incorporated as a game artist, and (2) Angela Grace Marcaida who works for Quick Strike Corporation as a graphic artist.

Research Instruments

Interview Guide Questionnaire – the guide questions were prepared prior the interview date. The guide questionnaires helped the researchers to have a smooth flow during the interview proper. The information gathered were used by the researchers as additional information on the production of the film.

Interview was conducted through a series of phone calls and e-mails with the interviewee.

Post Survey Questionnaires - Two sets of questions were prepared by the researchers on the post-evaluation phase of the study. One set was for the fishermen and residents of Cagayan Valley and authorized personnel of Bureau of Fisheries and Aquatic Resources – Region II,

Ludong Conservation and Research Department to assess the effectiveness of the film. The questionnaire was composed of a (5) point Likert scale to accumulate quantitative data that the researchers needed for the study. The researchers utilized the following description in the questionnaire: Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Additional comments and suggestions were also included on the BFAR personnel's questionnaire. The other set was prepared for the animators using a (4) point Likert scale and included a comment section. The researchers utilized animation experts' questionnaire using these descriptions: Strongly Agree, Agree, Disagree and Strongly Disagree.

Post evaluation on the fishers of Cagayan was conducted through a reliable individual who resides in Tuguegarao, Cagayan. As for BFAR, Ms. Evelyn Ame, the director of BFAR Region-II administered the evaluation. Questionnaires were distributed online with the use of google forms and e-mail. The researchers also provided hard copies and sent them through a courier.

Statistical Treatment of Data

Frequency Count and Percentage were used to treat the data for better understanding, presentation and

interpretation of the data which were presented in the next chapter of this paper.

Sources of Data

The researchers used a variety of methods to acquire the much needed data. The primary source that the researchers gathered came from the pre-evaluation, interview and post evaluation of the research phase. Secondary data that supported the study were given by Dr. Evelyn C. Ame. Her study about the said species appeared in an article: "Taxonomic identification of "Ludong" fish from the Cagayan River (Philippines)". Along with videos of TV shows that featured the said specie namely: 1) Kapuso mo Jessica Soho - Sept 25, 2014 Title: what makes *Ludong* the president's fish so expensive; 2) IJuander: May 1, 2014 - Learn how to Cook the President's Fish, the most expensive fish in the Philippines. The internet also provided much information regarding the ludong's nature through online books and articles.

Procedure

Planning Phase

The researchers decided on a topic and gathered the information from various sources including but not limited

to national and government archives, other relevant researches and the internet about the species. Moreover, the researchers also conducted selected first-hand interviews with pertinent and credible resource persons who are directly knowledgeable with the current state of the species. These were all collectively done to gather and bring forth the most accurate information to be used in the study and the subsequent production of the film.

Animation Process

Pre-Production

The researchers conceptualized the whole story, beginning from the title, script, character designs, character backgrounds, environmental design, and the storyboard. Adobe Photoshop was used to create background and character designs. Adobe Premiere Pro was utilized to create and compile the animatics.

Production

After completing the animatics, the researchers used Adobe Photoshop in finalizing the character designs and backgrounds. Character walk and swim cycles were made frame by frame on Adobe Photoshop software.
Adobe Premiere Pro was used in video editing creating

transition and effects of the film and final rendering. These were rendered in scenes in order to prevent technical problems. Recording and gathering of the characters' voices, voiceovers for the narration, background music and sound effects needed for the film were created accordingly. Garage Band software was used to record the character's voice and Final cut pro software noise reduction preset was used to fix the audio and reduce noise of the said recordings.

Post-Production

After rendering, the scenes were compiled in Adobe Premiere Pro including the background music, the narration, and subtitle to produce a complete video file.

Output

The researchers had their film and research documentation ready to be viewed for the post-evaluation.

Documentation

The film was viewed by the target audience of the researchers. The researchers administered a post-evaluation after they had conducted a film viewing to their respondents. The post evaluation results were the reflection of the research and film's effectiveness of

whether the researchers achieved the objectives of the study.

Results

This section shows the result or data obtained from the respondents in order to validate this study and support its objectives.

Pre-evaluation

Interview from Ms. Evelyn Ame was conducted through a series of phone calls, text message and electronic mails. She mentioned about their facility located at Aparri, Cagayan and the projects she instituted to support the ludong's conservation. She shared to the researchers a soft copy of an article she worked out with a group of biologist from around the country about the *ludong* species. She also mentioned that there are no *ludongs* residing in their facility at present – all of them did not survive the artificial habitat. She provided much needed materials that the researchers used about ludong such as articles, e-books and videos of the species.

Post-evaluation

Evaluation from Fishers

Table 1 shows that 60% of the respondents agreed that the story delivers a clear message about the conservation of the said specie. The respondents were able to grasp the message of the story regarding its aim to promote the conservation of *ludong*. Hence, 40% of the respondents strongly agreed.

Table 1

Message of the story regarding the conservation of ludong

	Frequency Count	Percentage (%)
Strongly Agree	4	40%
Agree	6	60%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 2 determines the respondents' awareness of the species after watching the film. Table 2.A-2.E determines the results in terms of the following: reproduction, lifespan, extinction, breeding place and conservation.

Table 2.A shows 50% of the respondents strongly agreed that the film provides awareness about the reproduction of the species. Further, the other half also agreed.

Table 2.A

Reproduction or Spawning

	Frequency Count	Percentage (%)
Strongly Agree	5	50%
Agree	5	50%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 2.B shows that 50% of the respondents agreed that the film shows the lifespan of the specie, while the 40% forty percent strongly agreed and the remaining 10% were undecided.

Table 2.B

Lifespan

	Frequency Count	Percentage (%)
Strongly Agree	4	40%
Agree	5	50%
Undecided	1	10%
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 2.C shows that the 90% of the responded strongly agreed that the film gives information about the ludong's extinction. Further, the remaining 10% agreed.

Table 2.C

Extinction

	Frequency Count	Percentage (%)
Strongly Agree	9	90%
Agree	1	10%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 2.D This table shows that 60% of the respondents agreed that the film given information about the ludong's breeding place. Meanwhile, the remaining 40% strongly agreed.

Table 2.D

Breeding Place

	Frequency Count	Percentage (%)
Strongly Agree	4	40%
Agree	6	60%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 2.E This table shows that the 90% of the respondents strongly agreed that the film displays

information about the conservation of the species. Further, the remaining 10% agreed.

Table 2.E

Conservation

	Frequency Count	Percentage (%)
Strongly Agree	9	90%
Agree	1	10%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 3 shows that 90% of the respondents strongly agreed that the film gives sufficient information about the said species. Further, the remaining 10% agreed.

Table 3

Sufficient information about the lobed river mullet

	Frequency Count	Percentage (%)
Strongly Agree	9	90%
Agree	1	10%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 4 shows that 80% of the respondents strongly agreed that improper fishing can affect the future economy. Further, the 20% of the respondents agreed.

Table 4

Information about improper fishing

	Frequency Count	Percentage (%)
Strongly Agree	8	80%
Agree	2	20%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 5 shows that 90% of the respondents strongly agreed that planning and scheduling of fishing must be implemented. Further, the remaining 10% agreed.

Table 5

Planning and scheduling of fishing

	Frequency Count	Percentage (%)
Strongly Agree	9	90%
Agree	1	10%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Table 6 shows the 100% of the respondents strongly agreed that the animated film can be used to spread awareness about the species.

Table 6

Spreading of awareness about ludong in the community of Cagayan using an animated film

	Frequency Count	Percentage (%)
Strongly Agree	10	100%
Agree	0	0
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	10	100%

Evaluation from Residents of Cagayan

Table 7 shows that 62.5% of the respondents agreed that the story delivers clear message about the conservation of the said species. The respondents were able to grasp the message of the story regarding its aim to promote the conservation of ludong. However, 25% of the respondents strongly agreed and the remaining 12.5% were undecided if the film delivered a clear message about the conservation of the said specie.

Table 7

Message of the story regarding the conservation of ludong

	Frequency Count	Percentage (%)
Strongly Agree	4	25%
Agree	10	62.5%
Undecided	2	12.5%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 8 determines the respondents' awareness of the species after watching the film. Table 8.A-8.E determines the results in terms of the following: reproduction, lifespan, extinction, breeding place and conservation.

Table 8.A shows that 68.8% of the respondents agreed that the film provided awareness about the reproduction of the specie. However, 12.5% strongly agreed and the remaining 18.8% were undecided if the film provides awareness about the reproduction of the species.

Table 8.A

Reproduction or Spawning

	Frequency Count	Percentage (%)
Strongly Agree	2	12.5%
Agree	11	68.8%
Undecided	3	18.8%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 8.B shows that the 62.5% of the respondents agreed that the film shows the lifespan of the species. Further, 18.8% of the respondents strongly agreed and the remaining 18.8% were undecided if the film showed the lifespan of the species.

Table 8.B

Lifespan

	Frequency Count	Percentage (%)
Strongly Agree	3	18.8%
Agree	10	62.5%
Undecided	3	18.8%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 8.C shows that the 87.5% of the respondents strongly agreed that the film given information about the ludong's extinction. Further, 12.5% of the respondents agreed.

Table 8.C

Extinction

	Frequency Count	Percentage (%)
Strongly Agree	14	87.5%
Agree	2	12.5%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 8.D shows that 62.5% of the respondents agreed that the film provides information about the breeding place of the species. Further, 12.5% of the respondents agreed and the remaining 25% were undecided if the film provides information about the breeding place of the said species.

Table 8.D

Breeding Place

	Frequency Count	Percentage (%)
Strongly Agree	2	12.5%
Agree	10	62.5%
Undecided	4	25%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 8.E shows that 68.8% of the respondents agreed that the film displays information about the conservation of the species. However, 18.8% of the respondents agreed and 12.5% were undecided if the film displays information about the conservation of the species.

Table 8.E

Conservation

	Frequency Count	Percentage (%)
Strongly Agree	3	18.8%
Agree	11	68.8%
Undecided	2	12.5%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 9 shows that the 62.5% of the respondents agreed that the film gives sufficient information about the said species. Meanwhile, 6.3% of the respondents strongly agreed

and the remaining 31.3% were undecided if the film gave sufficient information about the species.

Table 9

Sufficient information about the lobed river mullet

	Frequency Count	Percentage (%)
Strongly Agree	1	6.3%
Agree	10	62.5%
Undecided	5	31.3%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 10 shows that 100% of the respondents strongly agreed that improper fishing can affect the future economy.

Table 10

Information about improper fishing

	Frequency Count	Percentage (%)
Strongly Agree	16	100%
Agree	0	0
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 11 shows that 100% of the respondents strongly agreed that planning and scheduling of fishing must be implemented in Cagayan.

Table 11

Planning and scheduling of fishing

	Frequency Count	Percentage (%)
Strongly Agree	16	100%
Agree	0	0
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Table 12 shows that 43.8% of respondents agreed that *ludong* may be considered as a national treasure. Meanwhile, 37.5% of the respondents strongly agreed and 18.8% of the respondents were undecided.

Table 12

Perception that lobed river mullet species or ludong may be considered a national treasure

	Frequency Count	Percentage (%)
Strongly Agree	6	37.5%
Agree	7	43.8%
Undecided	3	18.8%
Disagree	0	0
Strongly Disagree	0	0
Total	16	100%

Evaluation from BFAR

Table 13 shows that 66.67% of the respondents strongly agreed that the story delivers a clear message about the conservation of the said species. The respondents were able

to grasp the message of the story regarding its aim to promote the conservation of ludong. Further, the remaining 33.33% agreed.

Table 13

Message of the story regarding the conservation of ludong.

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	1	33.33%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 14 determines the respondents' awareness of the species after watching the film. Table 14.A-14.E determines the results in terms of the following: reproduction, lifespan, extinction, breeding place and conservation.

Table 14.A shows that 100% of the respondents strongly agreed that the film provides awareness about the reproduction of the species.

Table 14.A

Reproduction or Spawning

	Frequency Count	Percentage (%)
Strongly Agree	3	100%
Agree	0	0
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 14.B shows that 33.33% of the respondents strongly agreed. While, 33.33% also agreed that the film shows the lifespan of the species and the remaining 33.33% of the respondents were undecided.

Table 14.B

Lifespan

	Frequency Count	Percentage (%)
Strongly Agree	1	33.33%
Agree	1	33.33%
Undecided	1	33.33%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 14.C This table shows that the 66.67% strongly agreed that the film gives information about the ludong's extinction. Further, the remaining 33.33% agreed.

Table 14.C

Extinction

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	1	33.33%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 14.D It shows that 33.33% of the respondents strongly agreed that the film provides an information about the breeding place of the species. Hence, 33.33% of the respondents agreed and the remaining 33.33% were undecided.

Table 14.D

Breeding Place

	Frequency Count	Percentage (%)
Strongly Agree	1	33.33%
Agree	1	33.33%
Undecided	1	33.33%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 14.E This table shows that 66.67% of the respondents strongly agreed that the film displays information about the conservation of the species. Hence, the remaining 33.33% were undecided.

Table 14.E

Conservation

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	0	0
Undecided	1	33.33%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 15 shows that 33.34% of the respondents strongly agreed that the film gives sufficient information about the said species. Further, 33.34% of the respondents agreed and the remaining 33.34% were undecided.

Table 15

Sufficient information about the lobed river mullet

	Frequency Count	Percentage (%)
Strongly Agree	1	33.34%
Agree	1	33.34%
Undecided	1	33.34%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 16 shows that 33.34% of the respondents strongly agreed that improper fishing can affect the future economy. Further, 33.34% of the respondents agreed and 33.34% of the respondents were undecided.

Table 16

Information about improper fishing

	Frequency Count	Percentage (%)
Strongly Agree	1	33.34%
Agree	1	33.34%
Undecided	1	33.34%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 17 shows the 33.34% of the respondents strongly agreed that planning and scheduling of fishing must be implemented. Further, 33.34% of the respondents agreed and 33.34% were undecided.

Table 17

Planning and scheduling of fishing

	Frequency Count	Percentage (%)
Strongly Agree	1	33.34%
Agree	1	33.34%
Undecided	1	33.34%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 18 shows that 66.67% of respondents strongly agreed that post-advertisements can be used to inform the community about the endangered species.

Table 18

Post-advertisements such as posters, brochures, newspaper ads to inform the community

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	1	33.33%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 19 shows that 66.67% of respondents strongly agreed that film viewing about conservation of *ludong* can be used to spread awareness about the species. Further, 33.33% of the respondents agreed.

Table 19

Disseminating information about conservation awareness through film viewing must be implemented.

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	1	33.33%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 20 shows that 66.67% of the respondents strongly agreed that the animated film provides awareness about the species. Hence, 33.33% of the respondents were undecided.

Table 20

The animated film may help provide awareness about lobed river mullet specie or ludong

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	0	0
Undecided	1	33.33%
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Table 21 shows the 66.67% of respondents strongly agreed that the *ludong* may be considered as a national treasure. Further, 33.33% of the respondents were undecided.

Table 21

Perception that lobed river mullet specie or ludong may be considered a national treasure

	Frequency Count	Percentage (%)
Strongly Agree	2	66.67%
Agree	1	33.33%
Undecided	0	0
Disagree	0	0
Strongly Disagree	0	0
Total	3	100%

Evaluation from Animation Experts

Table 22 Character design – shows that both animators agreed the character design fits the storyline.

Table 22

Appropriateness of the Character Design

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	2	100%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Table 23 Background design shows that one animator strongly agreed the effectiveness of the environment design and the other agreed.

Table 23

Appropriateness of the Background Design

Answer	Frequency Count	Percentage (%)
Strongly Agree	1	50%
Agree	1	50%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Table 24 shows that (2/2) two out of two animators agreed that the camera angles provided are appropriate for the scenes.

Table 24

Appropriateness of Camera Angles used in the Film

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	2	100%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Table 25 shows (50%) fifty percent of the respondents agreed the film shows clear staging the other (50%) fifty percent disagreed.

Table 25

Staging is clear

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	1	50%
Disagree	1	50%
Strongly Disagree	0	0
Total	2	100%

Table 26 shows (1/2) one out of two animators strongly agreed that the film duration was appropriate for the content while the other one disagreed.

Table 26

Sufficiency of the Duration of the film

Answer	Frequency Count	Percentage (%)
Strongly Agree	1	50%
Agree	0	0
Disagree	1	50%
Strongly Disagree	0	0
Total	2	100%

Table 27 shows (50%) fifty percent strongly agreed to the appropriateness of the language published. The rest agreed.

Table 27

Appropriateness of the language used

Answer	Frequency Count	Percentage (%)
Strongly Agree	1	50%
Agree	1	50%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Table 28 shows both animators agreed that the message of the story is presented well through the scenes of the film.

Table 28

Message of the story towards conservation of ludong

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	2	100%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Table 29 shows one animator agreed that the overall aesthetics was appropriate for the story and the other disagreed.

Table 29

Overall Aesthetics of the Film

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	1	50%
Disagree	1	50%
Strongly Disagree	0	0
Total	2	100%

Table 30 shows that both animators agreed that the sound effects contribute effectively to the film.

Table 30

Appropriateness of the Sound Effects

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	2	100%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Table 31 shows that both animators agreed that the background music adds to the overall appeal of the story.

Table 31

Appropriateness of the background music

Answer	Frequency Count	Percentage (%)
Strongly Agree	0	0
Agree	2	100%
Disagree	0	0
Strongly Disagree	0	0
Total	2	100%

Also included in the post-evaluation of the BFAR personnel and animation experts was their comments and suggestions regarding the film that the study produced.

Ms. Riza I. Undiana, Fishing Regulations Officer I, said that the message was good; nonetheless it should provide more information about the effects if this fish

will soon become extinct. It should have included the efforts and activities done by BFAR to conserve this fish species so that the people would know what the government does to conserve and protect this *ludong* as well as the inclusion of the new prohibitions when catching this fish species (newly amended RA 10654) and the BAC 247 (*Ludong* Closed Season) in Region 2. Moreover, it should provide more information about the importance of this fish species that when it becomes extinct we may not know what's going to happen.

Ms. Melanie Villarao, Fishing Regulations Officer II, said that the message delivered is clear and understandable and it captures the basic and most important information on the lobed river mullet. This does not only provide information but it also gives awareness to the public particularly to those who are directly engaged in fishing activities. With regard to the conservation aspect, more information should be delivered. It should be emphasized also the possible effects once the *ludong* has become extinct and what are the current programs (close and open season) being implemented on the ground to conserve and protect more the remaining population of *ludong* in Cagayan River. Nonetheless, the quality of the film is excellent.

The translation is good and the viewer clearly understands what is being delivered.

Experts from the Animation industry also evaluated the animated film. The animated film was posted on Youtube privately and the questionnaires were sent via email. The following were the feedbacks and comments of the experts:

Ms. Mary Jane Quiambao, works as a Game Artist at PlayHaus. She evaluated the film in terms of the animation setting, character, dubbing and the delivery of the story. According to Ms. Quiambao, the animation setting was pleasant and appealing. The characters that were used in the story were appropriate although they need to be polished as well as the voice. It would be better if there were additional animation scenes that show the lobed river mullet specie. Overall, the delivery of the story in the animation was satisfying.

Ms. Angela Grace Marcaida, works as a graphic artist at Quick Strike Corp. She did the evaluation of the film in terms of story, background music and the animation itself. According to Ms. Marcaida, the story was easy to understand and it was very informative. In addition, she said that the film had a good choice of background music. Overall, the

animation was pretty good and had a smooth flow, but it could use more movements.

Discussions

The study was done in phases with a 2D animated film as an output UPSTREAM: A 2D Animated Film Depicting the Factors on Survivability of Lobed River Mullet "Ludong" Specie – (*Cestraeus Plicatilis).* These phases were the Pre-production, Production and Post-production which were also subdivided into stages. Different instruments were used to gather the much needed data to support the researchers study.

The 2D animated film was about a biologist from the Bureau of Fisheries and Aquatic Resources who participated as a speaker on a conference about the endangered species in the country to college students taking biology as their major. He shared information about the species he is working on which is the lobed river mullet, locally known as "*ludong*". On the conference, he mentioned about the nature of the species and how the species differs from the others. He tried to convince the audience that the species should be recognized as an iconic fish of the country. Lastly, he discussed about the state of the fish at present and why it is declared as endangered species.

The researchers conducted a post evaluation survey to (3) authorized Bureau of Fisheries and Aquatic Resources personnel under the Ludong's Research and Conservation Department (10) ten fishers of Cagayan Valley who reside at Gattaran, Cagayan, Philippines, and (2) two animators who finished a course with animation as major and are currently practicing animation as it is the nature of their work. Questionnaires were provided online through google forms in order to efficiently distribute them.

The film was made to be viewed on most display devices such as personal computers, tablets, smart phones and other gadgets. To reach the ideal quality of the film, the researchers recommend to use a monitor that supports at least 1280x720 resolution to achieve the actual color intensity and appreciate the quality of the film. As for the film's audio, third-party speakers were suggested as well for clear voices and to appreciate the background music and sound effects.

Based from the survey results, the use of an animated film maybe implemented to promote awareness especially conservation

Conclusion

The results of the post-evaluation achieved the following from its objectives; 1.) Introduce the possibility that the *ludong* specie may soon become a national symbol of the Philippines – for the entire respondents strongly agreed about the usefulness of the film to promote awareness about the species and the majority also strongly agreed that the film depicts sufficient amount of information about the species, 2.) Increase awareness locally in the immediate communities along the Cagayan River to know how to avoid the specie's extinction – for the results showed positive feedbacks about promoting awareness through information regarding reproduction, lifespan, extinction, breeding place and conservation of the species, 3.) Show importance of the species conservation and unique characteristics through the story of the film – majority of the respondents strongly agreed. Finally, 4.) Invoke the use of an animated film in promoting or spreading awareness on the conservation of *ludong* – for a hundred percent of the respondents strongly agreed that the film is useful to promote awareness of the species conservation. Animation experts also gave positive feedbacks about producing an animated film in promoting the species importance and conservation. The researchers

therefore concluded that the film was effective and had met the objectives of the study.

Recommendations

The Bureau of Fisheries and Aquatic Resources – *Ludong* Conservation and Research Department recommends the film to be published on social media sites and to be displayed as local advertisement in government buildings in order to promote the species awareness.

After a thorough study on the factors depicting the survivability of the lobed river mullet, also known as "ludong" the researchers and animation experts recommend the use of an animated film to promote and/or support awareness for it delivers clear and concise information. The film did not only provide awareness and information but it also entertained the audience. Animated films are very pleasing to the eye and they easily convey a message. The effectiveness of the film exceeds the traditional way of spreading awareness such as through oral presentation, books, newspapers, articles and the like. Since this generation is at a "digital age", spreading such animated films through different gadgets, television and social media is highly possible.

Moreover, on the technical aspects of the study, it is recommended to use an excellent monitor graphics specification in order to improve the colors and quality of the 2D film being rendered.